Space Weather Forecast

Issued on Thursday 28 November 2024 at 12:27 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Low to Moderate Activity. Coronal Mass Ejection arrival Day 1 or Day 2 (28-29 Nov) with potential for G1-G2 Minor/Moderate Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Moderate in the past 24 hours, with the peak activity observed at 27/1246UTC from the southwest. There are nine active regions currently on the Earth-facing disc. The largest of these are both at south centre disc, with some interaction likely between the two regions, however these have remained relatively inactive. Also of note is a region in the northeast, which was the source of an larger flare from over the northeast limb. This appears to be a relatively simple group, dominated by a main spot, with much smaller satellites, however this remains difficult to assess due to its location. A new region emerging onto the southeast limb may be one region or two separate regions - for the time being it is classified as one region but this may change as it moves into a clearer viewing angle. The other regions are generally smaller and simpler, with no sign of notable growth or development.

An eruption was observed off the southeast disc at 27/1850 UTC from a filament, which is a line of material held together by the Sun's magnetic field, and can also be a source of Coronal Mass Ejections (CMEs). This is expected to pass mostly below Earth's orbit, perhaps with some glancing influence on 02 Dec. No other Earth-directed CMEs were observed.

Solar Wind / Geomagnetic Activity: Slow wind conditions persisted. Solar wind speeds were around 350-400km/s. Interplanetary Magnetic Field was mostly weak. The north-south component varied weakly. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is expected with isolated Moderate-class flares likely. There is a slight chance of Strong flares.

Solar Wind / Geomagnetic Activity: A CME from the eruption on 25 Nov is expected to arrive on Day 1 or early Day 2 (28-29 Nov), but low confidence on timing and impact of this feature, with the bulk of its material passing south and east. Otherwise, mainly background winds are expected. Initially Quiet geomagnetic activity, but with a likelihood of a period of Active to G1 Minor Storms

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from the CME arrival on Day 1 into Day 2. There is slight chance of G2 Moderate Storms. CME enhancements then easing with mainly Quiet to Unsettled conditions following.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background levels with only a slight chance of solar radiation storms occurring.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	**G1 to G2**	No	60	40	1	1
Strong	**G3**	No	5	5	1	1
Severe	**G4**	No	1	1	1	1
Extreme	**G5**	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**R1-R2 (M Class)**	Yes	60	60	60	60
Very Active	**R3-R5 (X Class)**	No	10	10	10	10

Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	10	10
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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